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Test report n°TR_23145

Item

Model: CPTOU3215 LS P1L3ARIEH-------Z0
P/N: 993202231505
S/N: 1010197
Type: Compact TFT Outdoor

Received: 19/12/2023
Start test: 20/12/2023
End test: 20/12/2023
Issued: 22/12/2023
Rev: 00

Activity

Railway interoperability

PRM TSI - Commission regulation (EU) No. 1300/2014

EN 16584 series

Railway applications - Design for PRM use - General requirements

Part 1: Contrast
Part 2: Information

Verdict

COMPLIANT

Attendees Stefania Anello

Tested by

Mirco Magoni
Laboratory Technician

Approved by

Marco Verzeroli
Laboratory Manager

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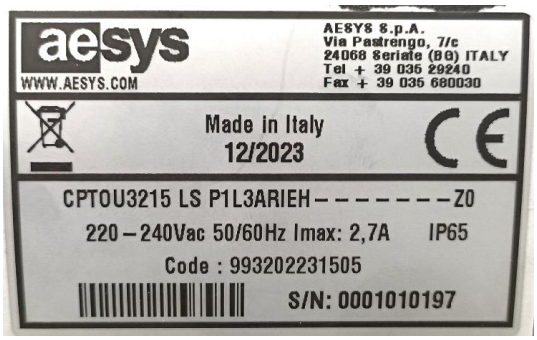
1 Item description

The DUT (Device Under Test), **CPTOU3215 LS P1L3ARIEH-------Z0**, is a variable message panel based on TFT technology used for video-information in railways applications.



Application:
- ☐ Railway On-board
- ☒ Railway Stationary
- ☐ Information Technology
- ☐ Public Transport / Automotive
- ☐ Traffic
- ☐ Maritime
- ☐ Car Racing
- ☐ Other

Use:
- ☐ Vehicle
- ☒ Fixed
- ☐ Portable

Type:
- ☐ Table top
- ☐ Floor standing
- ☐ Ceiling mounted
- ☒ Wall mounted
- ☐ Handheld

Ratings:
- Supply voltage: 220/240 VAC
- Frequency: 50/60 Hz
- Power: n/a
- Current: 2,7 A

Device main characteristics:
- Radio: n/a
- Data: n/a
- CPU type: 2229
- FW CPU: SSTFTS2229\F3F30E.2
- PC type: PCE MIO-5251
- Maximum clock frequency: 2 GHz
- SW config: DisplayConfig-7aa53dbbd707d0997ef00c350ec38a56.zip
- OS: WIN10_UDISPLAY5_BASE\V16
- Filter: n/a
- Other: n/a

Device configuration:
- Ping: DHCP
- Image: HTML page
- Brightness: AUTO
- Other: n/a

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2 Variants

Item	Name	Code	Differences
Tested model	CPTOU3215 LS P1L3ARIEH-------Z0	993202231505	-
Variant	-	-	-

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3 References

Applicable regulations/directives/standards
Regulations and directives
- **Directive (EU) 2016/797** of the European Parliament and of the Council of 11 May 2016 on the interoperability of the rail system within the European Union
- **Commission Regulation (EU) No 1300/2014** of 18 November 2014 on the technical specifications for interoperability relating to accessibility of the Union's rail system for persons with disabilities and persons with reduced mobility (as amended by Commission Implementing Regulation EU 2019/772 and Commission Implementing Regulation (EU) 2023/1694 of 10 August 2023)
Generic standards and guidelines
- **ERA/GUI/02-2013/INT version 1.1** – Guide for the application of the PRM TSI and Appendixes
- **EN 16584-1: 2017** – Railway applications - Design for PRM use - General requirements - Part 1: Contrast
- **EN 16584-2:2017** – Railway applications - Design for PRM use - General requirements - Part 2: Information
Others
- Q0614 PRM TSI Requirements Checklist – Compact TFT Outdoor – rev.0
- Q0615 Project Application Note – Compact TFT Outdoor – rev.0
- 73 232 4 05 - rev.0 – Mechanical drawing
- Q2203 PRM TSI ITT Specification – Compact TFT Outdoor – rev.0 – Initial Type Testing specification

4 Test specifications

Refer to specific test case.

5 Environmental conditions

Parameter	Criteria	Result	Verdict
Temperature	Between +15°C and +35°C	21,5°C	PASS
RH%	Between 25% and 75%	29,7%	PASS
Pressure	Between 860 and 1060 hPa	1011 hPa	PASS

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6 Test equipment

ID	Description	Model	Manufacturer	Serial n°	Last calibration	Next calibration
712	Chronometer	891-9889	RS-PRO		05/10/2022	05/10/2024
724	Typometer	325 mm	DCS Typometer		10/02/2023	10/02/2033
517	Digital caliper	CAL-IP65 (150 mm)	Tesa	9Z1141901	26/04/2023	26/04/2024
598	Digital caliper	Mega-Line 1000 mm	ALPA	0720-189-67R	18/07/2023	18/07/2024
689	Luxmeter	T-10A	KONICA MINOLTA	30021667-20020160	12/07/2022	12/07/2024
363	Luminance meter	CS-150	KONICA MINOLTA	30001446	15/08/2022	15/08/2024
549	Thermometer /hygrometer	175 H1	Testo	44601467	31/01/2023	31/01/2025
-	Floodlight	HMI1200	Clay Paky			
-	Table with goniometer scale for optical measurement	-	Aesys			
-	Digital Camera	M1803E6G	Redmi			
-	PC with installed sw debug tool and data connection cable	HP 290G2 MT Business PC Windows 10 Pro vers. 22H2				

7 Test cases and results

7.1 Initial checks

Check	Requirement	Outcome	Verdict
Mechanical parts	Good state	Good state	PASS
Electrical parts	Good state	Good state	PASS
Message visualisation	Correct visualisation	Correct visualisation	PASS
Data transmission	Correct transmission	Correct transmission	PASS

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7.2 Test Case - 01

7.2.1 Description and execution

Title				
Stationary Display - Display time of station names and words				
Requirement				
Displays shall be sized to show individual station names (which may be abbreviated) or words of messages. Each station name, or words of messages, shall be displayed for **a minimum of 2 seconds**. The term 'display' shall be understood as any support of dynamic information.				
Requirement reference				
TSI Regulation reference	4.2.1.0 (13) and 4.2.1.0 (8)			
Procedure				
EUT	Refer to Item description			
Tools	ID 712: Chronometer Digital Camera PC with installed SW debug tool and data connection cable			
P.1	• Switch on the EUT and PC tool. • Connect the PC to the EUT with the dedicated Ethernet cable and launch the application SW realizing the communication between PC and EUT and allowing to send from the PC to the EUT the pages (in HTML format) to be displayed for the purpose of the test. • Create, from one of the sample layout pages listed in document -, section 3.3, a test page containing complete station names and other related messages, displayed in fixed mode for at least 2 sec. • Send to the EUT the test page created. • Verify that the test page is displayed correctly (messages displayed in full as expected). • Measure with the chronometer that the test page content remains displayed in fixed mode for at least 2 sec and take pictures for the test report.			
P.2	• Keep the standard layout used in the previous step displayed. • If there is a clock in digits, verify that the information is expressed in the 24-hour system. • Take pictures for the test report.			
Specific values for the test				
SW tool used: *UDisplay v5.30.0.6*				
P.1	Name of the test page: Req_1.html			
	Displayed and verified station names: CASTELFIORENTINO SAMPIERDARENA			
P.2	Name of the test page: Req_1.html			
Measurements				
P.1	Target Values Expected:	Messages (station names and other words) displayed correctly on screen for a time : **≥ 2 sec**	Measured:	Time [sec] = > 2 sec
P.2	Target Values Expected:	If there is a clock in digits, the information must be expressed in the 24-hour system.	Measured:	Time in 24-hour format: Y ☒ N ☐
Verdict				
PASS				
Notes/Comments:				

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7.2.2 Pictures

Here below there is the static image, consisting of messages displayed for more than 2 seconds by the display during the test:

EUT during the test case - 01

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7.3 Test Case - 02

7.3.1 Description and execution

Title	
Stationary Display - Scrolling speed in horizontal and vertical scrolling mode	
Requirement	
If a scrolling display is used (either horizontal or vertical), each complete word shall be displayed for **a minimum of 2 seconds** and the horizontal scrolling speed shall **not exceed 6 characters per second.**	
Requirement reference	
TSI Regulation reference	4.2.1.0 (14)
Procedure	
EUT	Refer to Item description
Tools	ID 712: Chronometer Digital Camera PC with installed SW debug tool and data connection cable
P.1	**Test procedure for horizontal scrolling**: • Switch on the EUT and the PC tool. • Connect the PC to the EUT with the dedicated Ethernet cable and launch the application SW realizing the communication between PC and EUT and allowing to send from the PC to the EUT the pages (in HTML format) to be displayed for the purpose of the test. • Create a test page containing a visual area with horizontal scrolling text. Write a test word consisting of 60 consecutive W letters without spaces "WWWWWW... WWW" of an assigned font, chosen from those listed in document -, section 3.2 and of a size compatible with the defined and available visual area. • Set the set test page scrolling parameters (attribute <MARQUEE scrollAmount="?" scrollDelay="?">) to a value that results in a horizontal test scrolling speed of less than 6 characters/sec. • Send the test HTML page to the EUT and measure with the chronometer the time required to obtain a complete scroll of the test word "WWWW... WWW" of 60 characters. • Calculate the speed (in characters per second), measured as 60 divided by the scrolling measured time in seconds: $$vscroll = \frac{60}{Scrolling\ time}\ [characters/s]$$ Repeat the test for different fonts (see [9], section 3.2).
P.2	**Test procedure for persistence of the sliding messages for a time of at least 2 sec:** • Switch on the EUT and the PC tool. • Connect the PC to the EUT with the dedicated Ethernet cable and launch the application SW realizing the communication between PC and EUT and allowing to send from the PC to the EUT the pages (in HTML format) to be displayed for the purpose of the test. • Create, from a sample layout page listed in -, section 3.3, a test page containing two visual areas for displaying scrolling messages (one with vertical scrolling text and the other with horizontal scrolling). • Starting from the sample layouts of -, section 3.3, choose the words to display with scrolling mode in the respective areas above, selecting the longest words in the examples. • Use a font that is the same in style and body as the one used for the P.1 test. • Set the scrolling parameters of the test page (attribute <MARQUEE scrollAmount="?" scrollDelay="?">). For horizontal scrolling writing, choose the same values noted in the previous P.1 test to obtain a horizontal test scrolling speed less than 6 characters/s. • Send the test HTML page to the EUT and measure with the chronometer the dwell time of the complete words in both horizontal and vertical scrolling mode. • Note the values of the set scroll parameters (attribute <MARQUEE scrollAmount="?" scrollDelay="?">), the persistence times detected, and take some pictures for the test report. Repeat the test for different fonts (see -, section 3.2).

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Specific values for the test		
SW tool used: *UDisplay v5.30.0.6*		
P.1 FONT: FuturaBQ-Medium	Name of the test page: Req_2A - FUTURA BQ M.htm	
	FONT: FuturaBQ-Medium	Character size [pixels]: 40
	Horizontal scrolling speed parameters values: scrollAmount : 15 scrollDelay : 100	
	Value of the measured time for "WWW…W" Scrolling time [sec]: 18,69	
	Calculated scrolling speed vscroll [characters/sec]: 3,21	
P.1 FONT: ZURICH	Name of the test page: Req_2A - ZURICH.htm	
	FONT: ZURICH	Character size [pixels]: 40
	Horizontal scrolling speed parameters values: scrollAmount : 15 scrollDelay : 100	
	Value of the measured time for "WWW…W" Scrolling time [sec]: 17,04	
	Calculated scrolling speed vscroll [characters/sec]: 3,52	
SW tool used: *UDisplay v5.30.0.6*		
P.2 FONT: FuturaBQ-Medium	Name of the test page: Req_2 - FUTURA BQ M.htm	
	FONT: FuturaBQ-Medium	Character size [pixels]: 40
	Horizontal scrolling speed parameters values scrollAmount : 15 scrollDelay : 100	
	Vertical scrolling speed parameters values scrollAmount : 5	
	Persistence of the horizontal scrolling test word: Longest word evaluated: CASTELFIORENTINO Persistence time measured [sec]: 8,93	
	Persistence of the vertical scrolling test word: Longest word evaluated: CASTELFIORENTINO Persistence time measured [sec]: 7,64	
P.2 FONT: ZURICH	Name of the test page: Req_2 - ZURICH.htm	
	FONT: ZURICH	Character size [pixels]: 40
	Horizontal scrolling speed parameters values scrollAmount : 15 scrollDelay : 100	
	Vertical scrolling speed parameters values scrollAmount : 5	
	Persistence of the horizontal scrolling test word: Longest word evaluated: CASTELFIORENTINO Persistence time measured [sec]: 9,15	
	Persistence of the vertical scrolling test word: Longest word evaluated: CASTELFIORENTINO Persistence time measured [sec]: 7,78	

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Measurements				
P.1 FONT: FuturaBQ-Medium	Target Values Expected:	Calculated Speed: ≤ **6 characters per second.**	Measured:	Speed (Vscroll) [char/sec] = 3,21
P.1 FONT ZURICH	Target Values Expected:	Calculated Speed: ≤ **6 characters per second.**	Measured:	Speed (Vscroll) [char/sec] = 3,52
P.2 FONT: FuturaBQ-Medium	Target Values Expected:	Test words with horizontal scrolling displayed correctly and persistence time on display **≥ 2 sec.**	Measured:	Evaluated word = CASTELFIORENTINO
				Persistence time measured [sec]: 8,93
	Target Values Expected:	Test words with vertical scrolling displayed correctly and persistence time on display **≥ 2 sec.**	Measured:	Evaluated word = CASTELFIORENTINO
				Persistence time measured [sec]: 7,64
P.2 FONT ZURICH	Target Values Expected:	Test words with horizontal scrolling displayed correctly and persistence time on display **≥ 2 sec.**	Measured:	Evaluated word = CASTELFIORENTINO
				Persistence time measured [sec]: 9,15
	Target Values Expected:	Test words with vertical scrolling displayed correctly and persistence time on display **≥ 2 sec.**	Measured:	Evaluated word = CASTELFIORENTINO
				Persistence time measured [sec]: 7,78
Verdict:				
PASS				
Notes/Comments:				

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7.3.2 Test pictures

Here below there are the static images, where the scrolling speed is measured and a message is displayed for at least 2 sec.

3
Font
FuturaBQ-Medium
14:43
- Attenzione! CASTELFIORENTINO E' severamente vietato oltrepassare la linea gialla in attesa dei treni -- Si rammenta che è vietato aprire le porte dei treni e salire o scendere quando non sono completamente fermi -
- Attenzione! CASTELFIORENTINO E' severamente vietato oltrepassare

EUT during the test case – 02 – FONT FuturaBQ-Medium

3
Font
ZURICH
14:45
- Attenzione! CASTELFIORENTINO E' severamente vietato oltrepassare la linea gialla in attesa dei treni -- Si rammenta che è vietato aprire le porte dei treni e salire o scendere quando non sono completamente fermi -
- Attenzione! CASTELFIORENTINO E' severamente vietato oltrepassare la linea gialla in att

EUT during the test case – 02 – FONT ZURICH

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7.4 Test Case - 03

7.4.1 Description and execution

Title:	
Stationary Display - Maximum viewing distance according to the use.	
Requirement	
Displays shall be designed for a maximum viewing distance in accordance with the following formula: - Reading distance in mm divided by 250 = character height (for example: 10 000 mm/250 = 40 mm).	
Requirement reference	
TSI Regulation reference	4.2.1.0 (15)
Procedure	
EUT	Refer to Item description
Tools	ID 724: Typometer ID 341: Digital caliper ID 598: Digital caliper Metric scale Digital Camera PC with installed sw. debug tool and data connection cable
P.1	• Switch on the EUT and the PC tool. • Connect the PC to the EUT with the dedicated Ethernet cable and launch the application SW realizing the communication between PC and EUT and allowing to send from the PC to the EUT the pages (in HTML format) to be displayed for the purpose of the test. • Create a HTML test page containing a sequence of capital letters and/or numbers written using a font selected from those available (see -, section 3.2) and different font bodies, including at least: - Min Character Body (40 px) - Max Character Body (400 px) - Extra Character Body (1300 px) An example is given in -, section 3.3, Figure 6. • Send the created test page to the EUT and, for each body, measure the hcar height of the displayed character "A" (in mm) and calculate the minimum reading distance (dmin) expected for TSI interoperability with the following formula: *dmin = hcar * 250 [mm]* • Write down for each body of the character, the calculated theoretical minimum reading distance. • Place the display on a metric scale and take pictures for the test report.
Specific values for the test	
SW tool used: *UDisplay v5.30.0.6*	
P.1 FONT: FuturaBQ-Medium	Name of the test page: Req_3_FuturaBQ-Medium.htm
	FONT: FuturaBQ-Medium
	Character height (hcar) measured: Character body (40 px): *hcar* [mm]: 10,11 Character body (400 px): *hcar* [mm]: 101,24 Character body (1300 px): *hcar* [mm]: 332,62
	Minimum reading distance (dmin) calculated: Character body (40 px): *hcar* [m]: 2,53 Character body (400 px): *hcar* [m]: 25,31 Character body (1300 px): *hcar* [m]: 83,155

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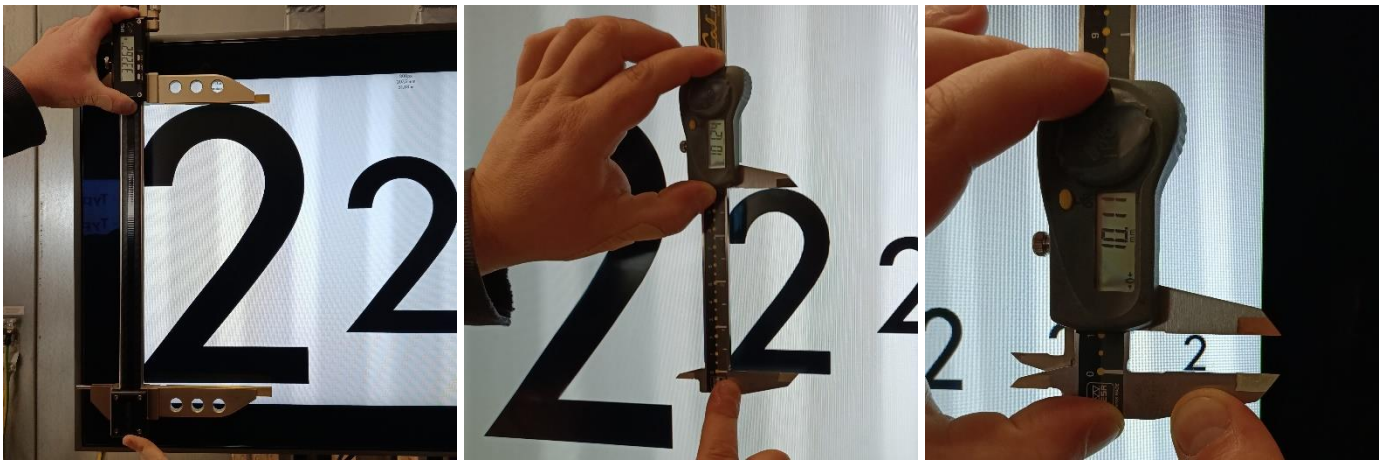
P.1 FONT: ZURICH	Name of the test page: Req_3_ZURICH.htm			
	FONT: ZURICH			
	Character height (hcar) measured: Character body (40 px): *hcar* [mm]: 9,59 Character body (400 px): *hcar* [mm]: 99,97 Character body (1300 px): *hcar* [mm]: 330,43			
	Minimum reading distance (dmin) calculated: Character body (40 px): *hcar* [m]: 2,4 Character body (400 px): *hcar* [m]: 24,99 Character body (1300 px): *hcar* [m]: 82,61			
Measurements				
P.1 FONT: FuturaBQ-Medium	Target Value Expected:	Character body (40 px): Distance for correct readability = *dmin* calculated	Measured:	Distance [m] = 2,53
	Target Value Expected:	Character body (400 px): Distance for correct readability = *dmin* calculated	Measured:	Distance [m] = 25,31
	Target Value Expected:	Character body (1300 px): Distance for correct readability = *dmin* calculated	Measured:	Distance [m] = 83,155
P.1 FONT ZURICH	Target Value Expected:	Character body (40 px): Distance for correct readability = *dmin* calculated	Measured:	Distance [m] = 2,4
	Target Value Expected:	Character body (400 px): Distance for correct readability = *dmin* calculated	Measured:	Distance [m] = 24,99
	Target Value Expected:	Character body (1300 px): Distance for correct readability = *dmin* calculated	Measured:	Distance [m] = 82,61
Verdict				
PASS				
Notes/Comments				

7.4.2 Test pictures



EUT during the test case – 03 – FONT: FuturaBQ-Medium

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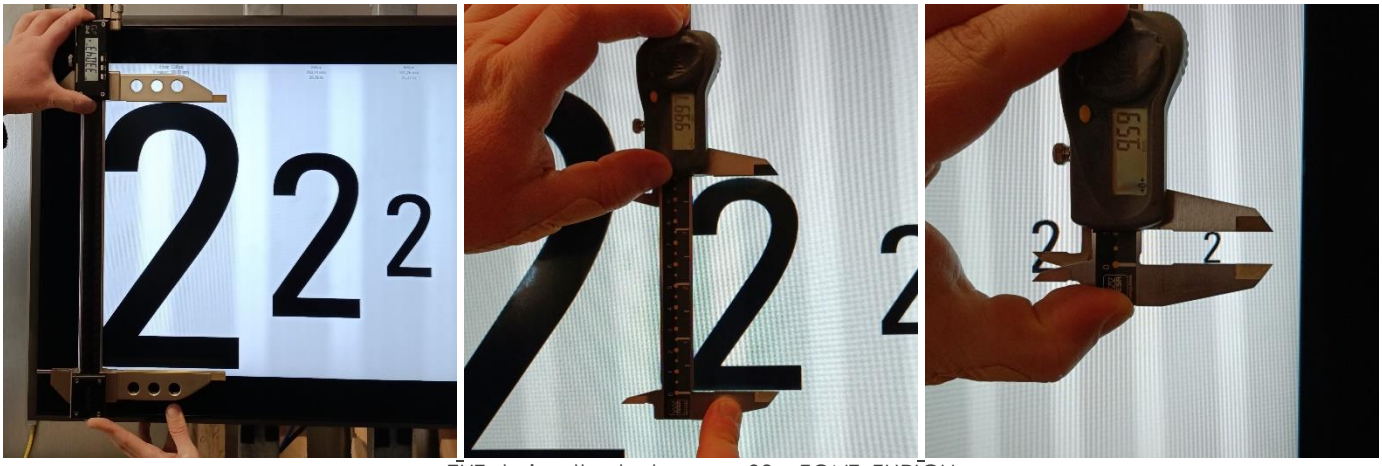

EUT during the test case – 03 – FONT: ZURICH

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7.5 Test Case - 04

7.5.1 Description and execution

Title:	
Stationary Display - Contrast of displayed characters in respect to the background	
Requirement	
The characters, symbols and pictograms used for visual information must contrast with the background. The display must ensure a **minimum contrast value of 0.6** (Background / Text) evaluated with EN 16584-1 Annex C method (formula C.1): $K = \frac{L_1 - L_2}{L_1 + L_2}$ where: L_1 = self-lit displays luminous density (display ON) L_2 = self-lit displays luminous density (display OFF) The contrast shall be observed without the effect of daylight and in presence of a vertical extraneous light with a L_F luminance of: - Internal displays brightness at least of 200 lx - External displays brightness at least of 2000 lx	
Requirement reference	
TSI Regulation reference	4.2.1.10 (2)
Procedure	
EUT	Refer to Item description
Tools	ID 363: Luminance meter ID 689: Luxmeter Floodlight source Digital Camera PC with installed sw. debug tool and data connection cable
P.1	• Place the display on the goniometric table necessary for the optical measurements. • Connect the PC to the EUT with the dedicated Ethernet cable and launch the application SW realizing the communication between PC and EUT and allowing to send from the PC to the EUT the pages (in HTML format) to be displayed for the purpose of the test. • Place the luxmeter sensor on the panel surface. • Place the luminance meter on a tripod, pointed vertically and perpendicular to the active area of the display. • Measure and adjust the floodlight luminance on display surface at a value $L_F \geq 200$ lx. • Turn on the display and set the TFT at the maximum brightness value. • Using the PC with the application SW, create an HTML test page containing "all black" areas and "all white" areas. • Send the created test page to the EUT. • Measure the brightness value reflected from the display screen "all black" (value L_2 luminous density in Cd/m^2). • Measure the brightness value emitted from the display screen "all white" (value L_1 luminous density in Cd/m^2) • Calculate the contrast ratio K, with the following formula: $K = \frac{L_1 - L_2}{L_1 + L_2}$ • Take the pictures for the report.

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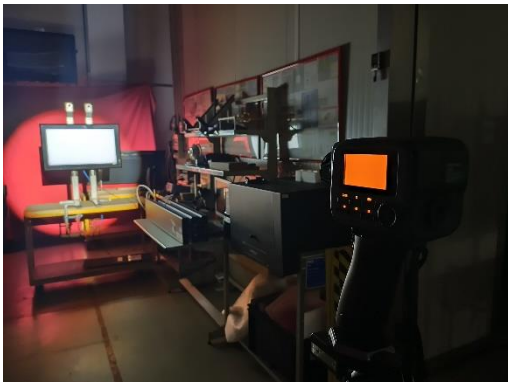
Specific values for the test				
P.1	SW tool used: *UDisplay v5.30.0.6*			
	Ambient light value L_F [lx]: 2043			
	Emitted brightness value L_1 [cd/m²] : 1837		Reflected brightness value L_2 [cd/m²] : 311,1	
Measurements				
P.1	Target Values Expected:	- The contrast ratio K measured must be greater than 0,6: **K ≥0,6**	Measured:	K = 0,71
Verdict				
PASS				
Notes/Comments				

7.5.2 Test pictures

Ambient light luminance measure		
	Floodlight (concentrated light source)	*Set-up and measurement of the value of 2043 lux*
Brightness measure (DISPLAY ON – all black)		
	Measurement of the value of L_2= 311,1 cd/m² (DISPLAY ON - "all black")	
Brightness measure (DISPLAY ON – all white)		
	Measurement of the value of L_1= 1837 cd/m² (DISPLAY ON - "all white")	

EUT during the test case - 04

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7.6 Test Case - 05

7.6.1 Description and execution

Title:
Stationary Display - Readability of the typeface.
Requirement
The typeface used for texts shall be easily readable. - The typeface used for texts must comply to following definition (ERA GUI 02-2013 INT-Appendix 2) : **2. Readability of a typeface** Written information should use Sans Serif fonts, in mixed case (i.e. not in capital letters only). Descenders (i.e. part of any of the characters g, j, p, q or y which protrudes below the level of the baseline as shown in the figure below) and ascenders (i.e. part of any of the characters b, d, f, h, i, j, k, l or t which protrudes above the x-height of the characters as shown in the figure below) should not be compressed. Descenders should have a minimum size ratio of 20% to the upper case characters.   **Key** a Baseline b Descender height c Ascender height d x-height of character e Uppercase character height Figure 11: typeface - definitions

Requirement reference	
TSI Regulation reference	4.2.1.10 (5)
Procedure	
EUT	Refer to Item description
Tools	ID 724: Typometer ID 341: Digital caliper ID 598: Digital caliper Digital Camera PC with installed sw. debug tool and data connection cable
P.1	• Switch on the EUT and the PC tool. • Connect the PC to the EUT with the dedicated Ethernet cable and launch the application SW realizing the communication between PC and EUT and allowing to send from the PC to the EUT the pages (in HTML format) to be displayed for the purpose of the test. • Create a test HTML page containing a word of upper/lower case letters (e.g. "Typeface") written using a font chosen from those indicated in section 3.2. • Send to the EUT the created test page and measure on the displayed word the **b**, **d**, **c**, **e** quotes (in mm) as indicated in the following drawing: • Check that the message displayed fulfills the following conditions: 1. The font typedef must be Sans Serif. 2. The ascender quote c must not be compressed (respect of uppercase letter height). 3. The character descender quote **b** must have the minimum ratio of 20% of uppercase letter quote **e**. • Take a picture for the report. • Repeat the test for all fonts (see -, par. 3.2).

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<table>
<tr><th colspan="5">Specific values for the test</th></tr>
<tr><td rowspan="6">P.1</td><td colspan="4">SW tool used: UDisplay v5.30.0.6</td></tr>
<tr><td rowspan="3">FONT 1
FuturaBQ-Medium</td><td colspan="3">Name of the test page: Req_5-FHD.png</td></tr>
<tr><td colspan="3">FONT: FuturaBQ-Medium</td></tr>
<tr><td colspan="3">Text message chosen for the test: Typeface</td></tr>
<tr><td rowspan="3">FONT 2
ZURICH</td><td colspan="3">Name of the test page: Req_5-FHD.png</td></tr>
<tr><td colspan="3">FONT: ZURICH</td></tr>
<tr><td colspan="3">Text message chosen for the test: Typeface</td></tr>
<tr><th colspan="5">Measurements</th></tr>
<tr><td>P.1
FONT 1
FuturaBQ-Medium</td><td>Target Values Expected:</td><td>- The character font must be “Sans Serif” type
- The message must be mixed case
- Ascenders must not be compressed
- Descenders must not be misaligned
- Descenders size ratio must be: b ≥ (20 %) * e</td><td>Measured:</td><td>Sans serif: Y ☒ N ☐
Mixed case: Y ☒ N ☐
c not compressed: Y ☒ N ☐
b not misaligned: Y ☒ N ☐
e [mm] = 150
b [mm] = 50
percentage [%] = 33</td></tr>
<tr><td>P.1
FONT 2
ZURICH</td><td>Target Values Expected:</td><td>- The character font must be “Sans Serif” type
- The message must be mixed case
- Ascenders must not be compressed
- Descenders must not be misaligned
- Descenders size ratio must be: b ≥ (20 %) * e</td><td>Measured:</td><td>Sans serif: Y ☒ N ☐
Mixed case: Y ☒ N ☐
c not compressed: Y ☒ N ☐
b not misaligned: Y ☒ N ☐
e [mm] = 162
b [mm] = 38
percentage [%] = 23</td></tr>
<tr><th colspan="5">Verdict</th></tr>
<tr><td colspan="5">PASS</td></tr>
<tr><th colspan="5">Notes/Comments</th></tr>
<tr><td colspan="5"></td></tr>
</table>

7.6.2 Test pictures

EUT during test case - 05

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8 Final outcomes

8.1 Summary table

Test case	Target value expected		Measured value		Verdict
Test case - 001 Stationary Display - Display time of station names and words	Messages (station names and other words) displayed correctly on screen for a time : **≥ 2 sec**		FONT: FuturaBQ-Medium	> 2 sec	PASS
			FONT: ZURICH		
	If there is a clock in digits, the information must be expressed in the 24-hour system.		24 h		PASS
Test case - 002 Stationary Display - Scrolling speed in horizontal and vertical scrolling mode	Horizontal scrolling speed: **≤ 6 characters per second**		FONT: FuturaBQ-Medium	3,21 sec	PASS
			FONT: ZURICH	3,52 sec	
	Test words with horizontal scrolling displayed correctly and persistence time on display **≥ 2 sec.**		FONT: FuturaBQ-Medium	> 2 sec	PASS
			FONT: ZURICH	> 2 sec	
	Test words with vertical scrolling displayed correctly and persistence time on display **≥ 2 sec.**		FONT: FuturaBQ-Medium	> 2 sec	PASS
			FONT: ZURICH	> 2 sec	
Test case - 003 Stationary display - Maximum viewing distance according to the use	Distance for correct vision and readability of the message **≥ dmin** calculated	Character body (40 px):	FONT: FuturaBQ-Medium	2,53 m	PASS
			FONT: ZURICH	2,4 m	PASS
		Character body (400 px):	FONT: FuturaBQ-Medium	25,31 m	PASS
			FONT: ZURICH	24,99 m	PASS
		Character body (1300 px):	FONT: FuturaBQ-Medium	83,155 m	PASS
			FONT: ZURICH	82,61 m	PASS
Test case - 004 Stationary display - Contrast of displayed characters in respect to the background	The contrast ratio measured must be: **K ≥0,6**		K= 0,71		PASS
Test case - 005 Stationary display - Readability of the typeface	**1.** The character font **must be** **"Sans Serif" type** **2.** The message must be **mixed case** **3.** Ascenders must **not** be **compressed** **4.** Descenders must **not** be **misaligned** **5.** Descenders size ratio must be: **b ≥ (20 %)* e**		FONT: FuturaBQ-Medium	23%	PASS
			FONT: ZURICH	33%	PASS

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8.2 ITT final results

Test	Requirement	Result	Notes	Verdict
-Q2203 PRM TSI ITT Specification - Compact TFT Outdoor – rev.0	Compliant with the Test case specified [9]	Compliant with the Test case result expected [9]		PASS

9 Annex A

9.1 Measurement uncertainty

Uncertainties estimated according to IUC22006_rev00 - Measurement uncertainty - Optical testing and timing measurements:

Input quantity	Instrument	Uncertainty		
		Value	Unit	Coverage
Luminance	CS-150	± 1,42	%	k = 2
Chromaticity coordinate x	CS-150	± 0,18	%	k = 2
Chromaticity coordinate y	CS-150	± 0,05	%	k = 2
Luminance	T-10A	± 1,20	%	k = 2
Time	891-9889	± 0,30	s	k = 2

END OF TEST REPORT

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